Vol. 203
Index

2002

INDEX

A

Abundance, 263
Acetylcholine, 231
Acetylcholine mediates excitatory input to chromatophore motoneurons in the squid, *Loligo pealeii*, 231
Acid-base balance, 42
Actin filament, 206
ADAMS, C. E., see D. E. W. Arnolds, 188
Adhesion, 338
Air exposure, 42
Algal
  bloom, 244
  physiology, 1
ALLEN, MATT C., see Jeremy M. Testa, 255
Ammonium, 258
Amorphous calcium carbonate, 269
Amphipod, 248
Amplexus, 225
Anatomical correlates of venom production in *Conus californicus*, 27
ANDERSON, DON, see Jane La Du, 244
Anesthetic, 188
Anion channel, 194
Annual Report of the Marine Biological Laboratory, v. 203(1) R1
Anomalocera ornata, 307
Anthopleura spp., 315
Aplacophoran embryo, 87
Apoptosis, 70
ARMSTRONG, MARGARET T., see Peter B. Armstrong, 203
ARMSTRONG, PETER B., MARGARET T. ARMSTRONG, R. L. PARDY, ALICE CHILD, AND NORMAN WAINWRIGHT, Immunohistochemical demonstration of a lipopolysaccharide in the cell wall of a eukaryote, the green alga *Chlorella*, 203
ARNOLDS, D. E. W., S. J. ZOTTOLI, C. E. ADAMS, S. M. DINEEN, S. FEVRIER, Y. GUO, AND A. J. PASCAL, Physiological effects of tricaine on the supramedullary/dorsal neurons of the cunner, *Tautogolabrus adspersus*, 188
Arthropod relationships, 221
ATEMA, JELLE, see Sarah M. Rohrkasse, 235
Axon
  injury, 219
  perfused, 189
  repair, 219
  sealing, 219

B

Bacterioplankton, 251
Bacterioplankton community composition in flowing waters of the Ipswich River watershed, 251
BAKER, ROBERT, see Werner Graf, 236
Balanus, 173
BARLOW, R. B., see K. Smith, 222; C. Ridings, 224; Douglas Borst, 227
Barnacle, 173
BARNES, DAVID K. A., Clade perseverance from Mesozoic to present: a multidisciplinary approach to interpretation of pattern and process, 161
BARRON, STACY, CAROLYN WEBER, ROXANNE MARINO, ERIC DAVIDSON, GABRIELLE TOMASKY, AND ROBERT HOWARTH, Effects of varying salinity on phytoplankton growth in a low-salinity coastal pond under two nutrient conditions, 260
BARRON, STACY, SEE CAROLYN F. WEBER, 261
BARTMAN, MARC, see Robert B. Silver, 213
BAUER, RAYMOND T., Tests of hypotheses on the adaptive value of an extended male phase in the hermaphroditic shrimp *Lysmata wurdemanni* (Caridea: Hippolytidae), 347
Behavior, 112, 197, 224, 227, 232
  predatory, 241
  social, 240
Benthic community, 256
BINGHAM, JON-PAUL, see Jennifer Marshall, 27
Biochemical differences between trail mucus and adhesive mucus from marsh periwinkle snails, 338
Biochemistry, sea anemone, 315
Biomineralization, 269
BITTNER, GEORGE D., see Christopher S. Eddleman, 219
Blade motion, 1
Blockade of an inward sodium current facilitates pharmacological study of hemi-gap-junctional currents in *Xenopus* oocytes, 192
Blood cell, 204
BODZNICK, DAVID, see John Montgomery, 238
BORLEY, KIMBERLY A., HERMAN T. EPSTEIN, AND ALAN M. KUZIRIAN, Effects of a sensory block on calexcitin levels in the photoreceptors of *Hermissenda crassicornis*, 197
BORST, D., see C. Ridings, 224
BORST, DOUGLAS, AND ROBERT BARLOW, Circadian rhythms in locomotor activity of juvenile horseshoe crabs, 227
Brackish water, 261
BRAUN, A., see K.-G. Lee, 204
BROWN, JEREMIAH R., ELIZABETH M. PEACOCK-VILLADA, AND GEORGE M. LANGFORD, Globular tail fragment of myosin-V displaces vesicle-associated motor and blocks vesicle transport in squid nerve cell extracts, 210
BRUMWELL, GORDON B., AND VICKI J. MARTIN, Immunocytochemically defined populations of neurons progressively increase in size through embryogenesis of *Hydra vulgaris*, 70
BUCHSBAUM, ROBERT, see John P. Ludlam, 250
BURNETT, LOUIS, NORA TERWILLIGER, AMY CARROLL, DARWIN JORGENSEN, AND DAVID SCHOLNICK, Respiratory and acid-base physiology of the purple sea urchin, *Strongylocentrotus purpuratus*, during air exposure: presence and function of a facultative lung, 42
BYSTROVA, OLGA A., see Marina G. Martynova, 104

C

Ca^{2+} effects on myosin-II-mediated contraction of pseudo-contractile rings and transport of vesicles in extracts of clam oocytes, 206
Calanopia americana, 307
Calcium, 206, 213
  metabolism, 269
  storage, 269
Calcium-dependent phospholipase A2, 213
Calcium-independent phospholipase A2, 213
Calexcitin, 197
Canopy structure, 248
Caranx latus, 241
Caranx latus (Carangidae) chooses dock pilings to attack silverside schools: a tactic to interfere with stereotyped escape behavior of prey?, 241
Carbenoxolone, 192
Carbon, 228
Caridea, 347
CARMICHAEL, RUTH H., see Dianne N. Suggs, 225; Emily F. Gaines, 228
CARROLL, AMY, see Louis Burnett, 42

CARTON, GUY, see John Montgomery, 238
Catalase, 212
Cell cycle, 58
Central pathways mediating oculomotor reflexes in an elasmobranch, *Scyliorhinus canicula*, 236
Central pattern generator, 152
Centropages typicus, 307
Cephalopod, 14, 231, 232
Cerebellar-like, 238
Cerebellum, 238
CERMAK, MICHAEL J., *Caranx latus* (Carangidae) chooses dock pilings to attack silverside schools: a tactic to interfere with stereotyped escape behavior of prey?, 241
CHAIKHOUTDINOV, I., see K.-G. Lee, 204
CHANG, ERNEST S., see Jeffrey L. Spees, 331
CHANG, SHARON A., see Jeffrey L. Spees, 331
CHAPARRO, R., J. L. CHARPENTIER, AND R. COLLIN, Embryonic velar structure and function of two sibling species of *Crepidula* with different modes of development, 80
CHAPPELL, RICHARD L., see Stephen Redenti, 200
CHARETTE, MATTHEW A., see Jeremy M. Testa, 255
CHARPENTIER, J. L., see R. Chaparro, 80
Cheilostome, 161
Chemoreception, 235
CHIAO, CHUAN-CHIN, see Melissa M. Grable, 232
Chikarmane, Hemant M., see Jennifer L. Hsieh, 266
CHILD, ALICE, see Peter B. Armstrong, 203
Chlorella, 203
Chromatophore, 231
Circadian rhythms in locomotor activity of juvenile horseshoe crabs, 227
Cl^- and glutamate$^-$ competition for a volume-regulated anion channel, 194
Clade, 161
Clade perseverance from Mesozoic to present: a multidisciplinary approach to interpretation of pattern and process, 161
Clam, 206, 208
Cleavage, spiral, 87
Cnidaria, 70
COHEN, JONATHAN H., AND RICHARD B. FORWARD, JR., Spectral sensitivity of vertically migrating marine copepods, 307
COHEN, W., see K.-G. Lee, 204
COLLIN, R., see R. Chaparro, 80
Competition, 161, 173
  exploitation, 173
  interference, 173
Cone snail, 27
CONRAD, M., see K.-G. Lee, 204
Contractile ring, 206, 208
Copepod, 307
Crab, estuarine, 289
CRAWFORD, KAREN, Culture method for *in vitro* fertilization to hatching of the squid, *Loligo pealeii*, 216
Crepidula
  dilatata, 80
  fecunda, 80
CRUMP, BYRON C., see Uri Y. Levine, 251
Crustacean, 269
Culture, 216
Culture method for *in vitro* fertilization to hatching of the squid, *Loligo pealeii*, 216
Cuttlefish body patterns as a behavioral assay to determine polarization perception, 232
Cyanobacteria, 260
Cyclostome, 161
Cytoskeleton, 204

D

DAVIDSON, ERIC A., see Stacy Barron, 260; Carolyn F. Weber, 261
DEEGAN, LINDA, see Sarah Twichell, 256
DELANEY, MARTHA, CHRISTOPHER FOLLET, NICK RYAN, NICK HANNEY, JENNY LUSK-YABLICK, AND GABRIELE GERLACH, Social interaction and distribution of female zebrafish *(Danio rerio)* in a large aquarium, 240
DELGADO, GABRIEL A., ROBERT A. GLAZER, AND NICOLA J. STEWART, Predator-induced behavioral and morphological plasticity in the tropical marine gastropod *Strombus gigas*, 112
Denaturing gradient gel electrophoresis, 251
DENNY, MARK, AND LORETTA ROBERSON, Blade motion and nutrient flux to the kelp, *Eisenia arborea*, 1
DENNY, MARK W., ELIZABETH K. NELSON, AND KRISTINA S. MEAD, Revised estimates of the effects of turbulence on fertilization in the purple sea urchin *Strongylocentrotus purpuratus*, 275
DENOBILE, J., see K.-G. Lee, 204
DEPINA, ANA S., see Torsten Wöllert, 206, 208
Development
  molluscan, 278
  rate, 58
Development of the lateral eye of juvenile *Limulus*, 222
DGGE, 251
Diel vertical migration, 307
Diet, 228
DINEEN, S. M., see D. E. W. Arnolds, 188
Dinoflagellate, 244
Dissolved iron cycling in the subterranean estuary of a coastal bay: Waquoit Bay, Massachusetts, 255
DODGE, F. A., see K. Smith, 222; C. Ridings, 224
Dorsal cell, 188
DUNLAP, WALTER C., see J. Malcolm Shick, 315
DYHRMAN, SONYA, see Jane La Du, 244
Dysgerminoma, 265

E

Early neurogenesis in the horseshoe crab *Limulus polyphemus* and its implication for arthropod relationships, 221
Echinoderm, 42, 121
ECKELBARGER, KEVIN J., AND CRAIG M. YOUNG, Spermiogenesis and modified sperm morphology in the "seepworm" *Methanoaricia dendrobranchiata* (Polychaeta: Orbiniidae) from a methane seep environment in the Gulf of Mexico: implications for fertilization biology, 134
EDDLEMAN, CHRISTOPHER S., GEORGE D. BITTNER, AND HARVEY M. FISHMAN, SEM comparison of severed ends of giant axons isolated from squid *(Loligo pealeii)* and crayfish *(Procambarus clarkii)*, 219
EDDS-WALTON, PEGGY L., see Richard R. Fay, 195
Eelgrass habitat, 247
Effects of a sensory block on calexcitin levels in the photoreceptors of *Hermissenda crassicornis*, 197
Effects of haying on salt-marsh surface invertebrates, 250
Effects of individual size on pairing in horseshoe crabs, 225
Effects of varying salinity on phytoplankton growth in a low-salinity coastal pond under two nutrient conditions, 260
Egg
  capsule, 278
  envelope, 289
  laying, 289
  size, 58
Eisenia arborea, 1
Elasmobranch, 236
Embryo, 58, 70, 87, 278
  aplacophoran, 87
  attachment system, 289
  culture, 278
Embryogenesis and development of *Epimenia babai* (Mollusca Neomeniomorpha), 87
Embryonic velar structure and function of two sibling species of *Crepidula* with different modes of development, 80
Emersion, 42
Endotoxin, 203
Energy dissipation rate, 275
Enhancement, 200
Epidermal growth factor, 278
EPSTEIN, HERMAN T., see Kimberly A. Borley, 197

ERDNER, DEANA, see Jane La Du, 244
ERG, 198, 200
Error-driven motor learning in fish, 238
Escape, 144
Escape jet, 14
Estuarine crab, 289
Estuarine–open-water comparison of fish community structure in eelgrass *(Zostera marina* L.) habitats of Cape Cod, 247
Ethyl-*m*-aminobenzoate, 188
Evolution, 58
  molluscan, 87
  sea anemone, 315
Evolution of fast development of planktonic embryos to early swimming, 58
Exploitation competition, 173
Extracts, 206, 208
Eye development, 222
EYMAN, MARIA, see Antonio Giuditta, 189

F

Facultative lung, 42
FARLEY, GREGORY S., Helical nature of sperm swimming affects the fit of fertilization-kinetics models to empirical data, 51
FAY, RICHARD R., AND PEGGY L. EDDS-WALTON, Preliminary evidence for interpulse interval selectivity of cells in the torus semicircularis of the oyster toadfish *(Opsanus tau)*, 195
Fertilization, 51, 134, 275
  efficiency, 51
  kinetics, 51
  success, 275
FEVRIER, S., see D. E. W. Arnolds, 188
Filter feeder, 173
FINDLEY, ANN, see Earl Weidner, 212
Fish, 195, 238
Fish community structure, 247
FISHMAN, HARVEY M., see Christopher S. Eddleman, 219
Fixed action pattern, 144
Flow, 1
FOLLET, CHRISTOPHER, see Martha Delaney, 240
Food web, 228
Foraging, 248
FORWARD, RICHARD B., see Jonathan H. Cohen, 307
Fundulus heteroclitus, 248

G

GAINES, EMILY F., RUTH H. CARMICHAEL, SARA P. GRADY, AND IVAN VALIELA, Stable isotopic evidence for changing nutritional sources of juvenile horseshoe crabs, 228
Gammarus mucronatus, 248
Gap junction, 192
GARBER, SARAH S., AND MARY M. HOFFMAN, Cl^- and glutamate$^-$ competition for a volume-regulated anion channel, 194
GARRITT, ROBERT, see Sarah Twichell, 256
Gastropod, 278
Gating currents, 190
Gene expression, 189
Gene expression in the squid giant axon: neurotransmitter modulation of RNA transfer from periaxonal glia to the axon, 189
General Scientific Meetings of the Marine Biological Laboratory, 185
  featured reports, 185
Geographic
  information system, 253
  variability, 161
GERLACH, GABRIELE, see Martha Delaney, 240
GIBLIN, ANNE, see Ketil Koop-Jakobsen, 258
GILLAND, EDWIN, see Werner Graf, 236
GILLES, NICOLE L., see Melissa M. Grable, 232
GILLY, WILLIAM F., see Jennifer Marshall, 27
GIS, 253
GIUDITTA, ANTONIO, MARIA EYMAN, AND BARRY B. KAPLAN, Gene expression in the squid giant axon: neurotransmitter modulation of RNA transfer from periaxonal glia to the axon, 189
GLAZER, ROBERT A., see Gabriel A. Delgado, 112
Glia, 189
Globular tail fragment of myosin-V displaces vesicle-associated motor and blocks vesicle transport in squid nerve cell extracts, 210
GOLDBERG, JEFFREY I., see Shihuan Kuang, 278
GOULD, ROBERT M., see Nicholas Pahl, 217
GRABLE, MELISSA M., NADAV SHASHAR, NICOLE L. GILLES, CHUAN-CHIN CHIAO, AND ROGER T. HANLON, Cuttlefish body patterns as a behavioral assay to determine polarization perception, 232
GRADY, SARA P., see Dianne N. Suggs, 225; Emily F. Gaines, 228
GRAF, WERNER, EDWIN GILLAND, MATT MCFARLANE, LAURA KNOTT, AND ROBERT BAKER, Central pathways mediating oculomotor reflexes in an elasmobranch, *Scyliorhinus canicula*, 236
Groundwater, 255
Growth rate, 263
GTPase Rho is involved in myosin-II-mediated contraction of pseudocontractile rings and transport of vesicles in extracts of clam oocytes, 208
GUO, Y., see D. E. W. Arnolds, 188

H

Habitat structure, 241
HAMMAR, KATHERINE, see Gilad Twig, 198
HANLEY, JANICE, see Roxanna Smolowitz, 265
HANLON, ROGER T., see Melissa M. Grable, 232
HANNEY, NICK, see Martha Delaney, 240
Haying, 250
Hearing, 195
Heat-shock protein, 331
HECKER, ARNAUD, see Sefi Raz, 269
Helical nature of sperm swimming affects the fit of fertilization-kinetics models to empirical data, 51
Hemichannel, 192
HERBOLD, CRAIG W., see Jeremy M. Testa, 255
Hermaphroditism, 347
Hermissenda, 197
Histidine, 200
HOFFMAN, MARY M., see Sarah S. Garber, 194
HOMSI, SARA, see Nicholas Pahl, 217
Horseshoe crab, see *Limulus*
HOWARTH, ROBERT, see Stacy Barron, 260; Carolyn F. Weber, 261
HSIEH, JENNIFER L., HEMANT M. CHIKARMANE, ROXANNA SMOLOWITZ, KEVIN R. UHLINGER, W. MEBANE, AND ALAN M. KUZIRIAN, Microbial analysis of ozone disinfection in a recirculating seawater system, 266
HUFFAKER, DIANA, AND R. GIL PONTIUS, JR., Reconstruction of historical land cover in the Ipswich watershed, 253
HUGHES, JEFFREY, see Kristin Hunter-Thomson, 247; Bradley S. Williams, 248
HUNTER-THOMSON, KRISTIN, see Bradley S. Williams, 248
HUNTER-THOMSON, KRISTIN, JEFFREY HUGHES, AND BRADLEY WILLIAMS, Estuarine–open-water comparison of fish community structure in eelgrass *(Zostera marina* L.) habitats of Cape Cod, 247
Hunting tactic, 241
Hydrostatic skeleton, 14

I

Immunocytochemically defined populations of neurons progressively increase in size through embryogenesis of *Hydra vulgaris*, 70
Immunocytochemistry, 197
Immunofluorescence, 204
Immunohistochemical demonstration of a lipopolysaccharide in the cell wall of a eukaryote, the green alga *Chlorella*, 203
Impulse, 14
Influence of epiphytic algal coverage on fish predation rates in simulated eelgrass habitats, 248
Injury-induced vesiculation, 219

Interference competition, 173
Intertidal sediments, 258
Intestine, 42
In vitro fertilization, 216
Ion
  permeation, 194
  strength, 194
Ipswich River watershed, 251; 253
Iron, 255

J

JD1, 70
JORGENSEN, DARWIN, see Louis Burnett, 42

K

KAPLAN, BARRY B., see Antonio Giuditta, 189
KELLEY, WAYNE P., see Jennifer Marshall, 27
Kelp, 1
KIER, WILLIAM M., see Joseph T. Thompson, 14
KNOTT, LAURA, see Werner Graf, 236
KOOP-JAKOBSEN, KETIL, AND ANNE GIBLIN, Tidal flushing of ammonium from intertidal salt marsh sediments: the relative importance of adsorbed ammonium, 258
KUANG, SHIHUAN, MARETTE REGNIER, AND JEFFREY I. GOLDBERG, Long-term culture of decapsulated gastropod embryos: a transplantation study, 278
KUZIRIAN, ALAN M., see Kimberly A. Borley, 197; Jennifer L. Hsieh, 266

L

Labidocera aestiva, 307
LA DU, JANE, DEANA ERDNER, SONYA DYHRMAN, AND DON ANDERSON, Molecular approaches to understanding population dynamics of the toxic dinoflagellate *Alexandrium fundyense*, 244
LALF, 203
Land-use change, 253
LANDOWNE, DAVID, Perchlorate prevents sodium channel gating and sodium protects in the squid giant axon, 190
LANGFORD, GEORGE M., see Torsten Wöllert, 206, 208; Jeremiah R. Brown, 210
Larva, 58, 87, 121
Laser ablation, 278
LAWRENCE, K.A., AND W.H. WATSON III, Swimming behavior of the nudibranch *Melibe leonina*, 144
Learning, 197, 238
LEE, K.-G., A. BRAUN, I. CHAIKHOUTDINOV, J. DENOBILE, M. CONRAD, AND W. COHEN, Rapid visualization of microtubules in blood cells and other cell types in marine model organisms, 204
LEVINE, URI Y., AND BYRON C. CRUMP, Bacterioplankton community composition in flowing waters of the Ipswich River watershed, 251
LEVY, HANNA, see Gilad Twig, 198
Life history classification, 247
Light, 307
Limit oscillator, 213
Limulus, 221, 222, 224, 225, 227, 228, 235
  anti-lipopolysaccharide factor (LALF), 203
  behavior, 224, 227
  ommatidia, 222
  vision, 222, 224, 227
Lipopolysaccharide, 203
Lobster, 331
Locomotion, 14, 227
LOHSE, DAVID P., Relative strengths of competition for space and food in a sessile filter feeder, 173
Loligo, 216
Long-term culture of decapsulated gastropod embryos: a transplantation study, 278
Low-salinity system, 260
LUDLAM, JOHN P., DAVID H. SHULL, AND ROBERT BUCHSBAUM, Effects of haying on salt-marsh surface invertebrates, 250
LUQUET, GILLES, see Sefi Raz, 269
LUSK-YABLICK, JENNY, see Martha Delaney, 240
Lysmata wurdemanni, 347

M

MAAs, 315
Macroalgae, 1
MALCHOW, ROBERT PAUL, see Gilad Twig, 198
Mantle, 14
Marginal band, 204
Marine Biological Laboratory
  Annual Report, v. 203(1) R1
  General Scientific Meetings, 185
Marine diversity, 161
MARINO, ROXANNE, see Stacy Barron, 260; Carolyn F. Weber, 261
MARSHALL, JENNIFER, WAYNE P. KELLEY, STANISLAV S. RUBAKHIN, JON-PAUL BINGHAM, JONATHAN V. SWEEDLER, AND WILLIAM F. GILLY, Anatomical correlates of venom production in *Conus californicus*, 27
MARTIN, VICKI J., see Gordon B. Brumwell, 70
MARTINETTO, PAULINA, see Melissa Millman, 263
MARTYNOVA, MARINA G., AND OLGA A. BYSTROVA, Undifferentiated cells in the snail myocardium are capable of DNA synthesis and myodifferentiation, 104
Mass spectrometry, 27
Mate selection, 225
Mating, 347
MCCLINTOCK, JAMES B., see Minako Vickery, 121
MCFARLANE, MATT, see Werner Graf, 236
MEAD, KRISTINA S., see Mark W. Denny, 275
MEBANE, W., see Jennifer L. Hsieh, 266
Melibe leonina, 144, 152
Methane seep, 134
A metronome-like control of the calcium signal leading to nuclear envelope breakdown and mitosis in sand dollar *(Echinaracnius parma)* cells, 213
Microbial analysis of ozone disinfection in a recirculating seawater system, 266
Microbial sampling, 266
Microdomain, 213
Microtubule, 204
Midbrain, 195
MILLMAN, MELISSA, MIRTA TEICHBERG, PAULINA MARTINETTO, AND IVAN VALIELA, Response of shrimp populations to land-derived nitrogen in Waquoit Bay, Massachusetts, 263
Mitosis, 213
Mitotic apparatus, 213
MITTMANN, BEATE, Early neurogenesis in the horseshoe crab *Limulus polyphemus* and its implication for arthropod relationships, 221
Modeling, 253
Molecular approaches to understanding population dynamics of the toxic dinoflagellate *Alexandrium fundyense*, 244
Mollusc, 144, 152; 338
  development, 87, 278
  evolution, 87
MONTGOMERY, JOHN, GUY CARTON, AND DAVID BODZNICK, Error-driven motor learning in fish, 238
MORIN, MARTHA A., see Andrew M. Smith, 338
Morphogenesis and organogenesis in the regenerating planktotrophic larvae of asteroids and echinoids, 121
Morphology, 112
MORRISON, HILARY G., see Nicholas Pahl, 217
Motion and nutrient flux to the kelp, *Eisenia arborea*, 1
Motoneuron, 231
mRNAs located in *Squalus acanthias* (spiny dogfish) oligodendrocyte processes, 217
MS-222, 188
Mucus, 338
Muscle, 14

Mycosporine-like amino acid content in four species of sea anemones in the genus *Anthopleura* reflects phylogenetic but not environmental or symbiotic relationships, 315
Mycosporine-like amino acids (MAAs), 315
Myelination, 217
Myosin
-II, 206, 208
-V, 210

N

NELSON, ELIZABETH K., see Mark W. Denny, 275
Nerve cell extracts, 210
Nervous system development, 70
Neural correlates of swimming behavior in *Melibe leonina*, 152
Neurogenesis, 221
Neuron, supramedullary, 188
Neuropeptide expression, 70
NEWCOMB, JAMES M., see Winsor H. Watson III, 152
Nitrogen, 228
limitation, 261
A novel turtle retinal preparation for simultaneously measuring light-induced electrical activity and changes in metabolite levels, 198
Nudibranch, 144, 152
Nurse eggs, 80
Nutrient
flux, 1
limitation, 261
loading, 256
Nutrient and freshwater inputs from sewage effluent discharge alter benthic algal and infaunal communities in a tidal salt marsh creek, 256
Nutrient limitation of phytoplankton growth in Vineyard Sound and Oyster Pond, Falmouth, Massachusetts, 261

O

Oculomotor, 236
OKUSU, AKIKO, Embryogenesis and development of *Epimenia babai* (Mollusca Neomeniomorpha), 87
Oligodendrocyte, 217
Ommatidia, 222
Ontogeny, 14
Ontogeny of squid mantle function: changes in the mechanics of escape-jet locomotion in the oval squid, *Sepioteuthis lessoniana* Lesson, 1830, 14
Oocyte, 192, 206, 208
Open water, 247
Opposed band cilia, 80
Orchestia, 250
Osmoconformer, 42
Osmotic induction of stress-responsive gene expression in the lobster *Homarus americanus*, 331
Osphradium, 235
Ovigerous, 263
Oxygen, 198
Ozone disinfection, 266

P

PAHL, NICHOLAS, SARA HOMSI, HILARY G. MORRISON, AND ROBERT M. GOULD, mRNAs located in *Squalus acanthias* (spiny dogfish) oligodendrocyte processes, 217
Pancreatic carcinoma, 265
Paralytic shellfish poisoning, 244
PARDY, R. L., see Peter B. Armstrong, 203
PASCAL, A. J., see D. E. W. Arnolds, 188
PEACOCK-VILLADA, ELIZABETH M., see Jeremiah R. Brown, 210
PEARSE, JOHN S., see J. Malcolm Shick, 315
PEARSE, VICKI B., see J. Malcolm Shick, 315
Pelagic larval duration of the Caribbean wrasse, *Thalassoma bifasciatum*, 245
Perchlorate, 190
Perchlorate prevents sodium channel gating and sodium protects in the squid giant axon, 190
Perfused axon, 189
PERLMAN, IDO, see Gilad Twig, 198
Peroxisomal catalase in extrusion apparatus posterior vacuole of microsporidian spores, 212
pH, 198
PHILIBOTTE, JASON, Pelagic larval duration of the Caribbean wrasse, *Thalassoma bifasciatum*, 245
Philoscia, 250
Phosphate, 255
Physiological effects of tricaine on the supramedullary/dorsal neurons of the cunner, *Tautogolabrus adspersus*, 188
Phytoplankton, 260
Plankton, 58
Plum Island Sound, 250
Polychaete, 134
Polyubiquitin, 331
PONTIUS, R. GIL JR., see Diana Huffaker, 253
Population dynamics, 244
Predator-induced behavioral and morphological plasticity in the tropical marine gastropod *Strombus gigas*, 112
Predatory behavior, 241
Preliminary evidence for interpulse interval selectivity of cells in the torus semicircularis of the oyster toadfish *(Opsanus tau)*, 195
Programmed cell death, 70
Protandry, 347

Q

QIAN, HAOHUA, see Harris Ripps, 192
Queen conch, 112
Quinine, 192

R

Radula, 27
RAGO, ADAM, see Jeremy M. Testa, 255
Rapid visualization of microtubules in blood cells and other cell types in marine model organisms, 204
RAZ, SEFI, OLIVIER TESTENIERE, ARNAUD HECKER, STEVE WEINER, AND GILLES LUQUET, Stable amorphous calcium carbonate is the main component of the calcium storage structures of the crustacean *Orchestia cavimana*, 269
Recirculating system, 266
Reconstruction of historical land cover in the Ipswich watershed, 253
REDENTI, STEPHEN, AND RICHARD L. CHAPPELL, Zinc chelation enhances the zebrafish retinal ERG b-wave, 200
Redox, 255
Regeneration, 121
REGNIER, MARETTE, see Shihuan Kuang, 278
Relative strengths of competition for space and food in a sessile filter feeder, 173
Respiration, 42
Respiratory and acid-base physiology of the purple sea urchin, *Strongylocentrotus purpuratus*, during air exposure: presence and function of a facultative lung, 42
Response of shrimp populations to land-derived nitrogen in Waquoit Bay, Massachusetts, 263
Retina, 198, 200
Retinoic acid, 192
Revised estimates of the effects of turbulence on fertilization in the purple sea urchin *Strongylocentrotus purpuratus*, 275
RFamide, 70
Rho GTPase, 208
Rhythm, 144
RICHMOND, HAZEL, see Roxanna Smolowitz, 265
RIDINGS, C., see K. Smith, 222
RIDINGS, C., D. BORST, K. SMITH, F. DODGE, AND R. BARLOW, Visual behavior of juvenile *Limulus* in their natural habitat and in captivity, 224

RIPPS, HARRIS, HAOHUA QIAN, AND JANE ZAKEVICIUS, Blockade of an inward sodium current facilitates pharmacological study of hemi-gap-junctional currents in *Xenopus* oocytes, 192
RNA synthesis, 189
ROBERSON, LORETTA, see Mark Denny, 1
ROHRKASSE, SARAH M., AND JELLE ATEMA, Tracking behavior of Busyconinae whelks, 235
RUBAKHIN, STANISLAV S., see Jennifer Marshall, 27
RYAN, NICK, see Martha Delaney, 240

S

SAIGUSA, M., M. TERAJIMA, AND M. YAMAMOTO, Structure, formation, mechanical properties, and disposal of the embryo attachment system of an estuarine crab, *Sesarma haematocheir*, 289
Salinity, 260
Salt marsh, 250, 256, 258
Sand dollar, 213
SCHOLNICK, DAVID, see Louis Burnett, 42
Sea anemone
  biochemistry, 315
  evolution, 315
  symbiosis, 315
Sea star, 144
Sea urchin, 42, 275
SEM comparison of severed ends of giant axons isolated from squid *(Loligo pealeii)* and crayfish *(Procambarus clarkii)*, 219
Seminoma, 265
Sensory block, 197
Sensory-motor integration, 231
Sepia, 232
Severed axon structure, 219
Sewage input, 256
Sex
  change, 347
  determination, 347
Shark hindbrain, 236
SHASHAR, NADAV, see Melissa M. Grable, 232
SHELDON, SALLIE, see Sarah Twichell, 256
SHICK, J. MALCOLM, WALTER C. DUNLAP, JOHN S. PEARSE, AND VICKI B. PEARSE, Mycosporine-like amino acid content in four species of sea anemones in the genus *Anthopleura* reflects phylogenetic but not environmental or symbiotic relationships, 315
SHOLKOVITZ, EDWARD R., see Jeremy M. Testa, 255
Shrimp, 347
SHULL, DAVID H., see John P. Ludlam, 250
SILVER, ROBERT B., AND MARC BARTMAN, A metronome-like control of the calcium signal leading to nuclear envelope breakdown and mitosis in sand dollar *(Echinaracnius parma)* cells, 213
Silversides, 241
Siphon, 235
SMITH, ANDREW M., AND MARTHA C. MORIN, Biochemical differences between trail mucus and adhesive mucus from marsh periwinkle snails, 338
SMITH, K., C. RIDINGS, F. A. DODGE, AND R. B. BARLOW, Development of the lateral eye of juvenile *Limulus*, 222
SMITH, K., see C. Ridings, 224
SMITH, PETER J. S., see Gilad Twig, 198
SMOLOWITZ, ROXANNA, see Jennifer L. Hsieh, 266
SMOLOWITZ, ROXANNA, JANICE HANLEY, AND HAZEL RICHMOND, A three-year retrospective study of abdominal tumors in zebrafish maintained in an aquatic laboratory animal facility, 265
SMOTHERMAN, MICHAEL, Acetylcholine mediates excitatory input to chromatophore motoneurons in the squid, *Loligo pealeii*, 231
Snail myocardium, 104
SNYDER, MARK J., see Jeffrey L. Spees, 331
Social interaction and distribution of female zebrafish *(Danio rerio)* in a large aquarium, 240
Sodium
  channel, 190
  current, 192
Spartina, 250
Spraguea lophii, 212
Spawning, 225
Spectral sensitivity, 307
Spectral sensitivity of vertically migrating marine copepods, 307
SPEES, JEFFREY L., SHARON A. CHANG, MARK J. SNYDER, AND ERNEST S. CHANG, Osmotic induction of stress-responsive gene expression in the lobster *Homarus americanus*, 331
Sperm
  -egg collision, 51
  development, 134
  swimming, 51
Spermiogenesis and modified sperm morphology in the "seepworm" *Methanoaricia dendrobranchiata* (Polychaeta: Orbiniidae) from a methane seep environment in the Gulf of Mexico: implications for fertilization biology, 134
Spiny dogfish, 217
Spiral cleavage, 87
Spore extrusion apparatus, 212
Squid, 189, 216
  giant axon, 190, 210
Stable amorphous calcium carbonate is the main component of the calcium storage structures of the crustacean *Orchestia cavimana*, 269
Stable isotopic evidence for changing nutritional sources of juvenile horseshoe crabs, 228
STAVER, JENNIFER M., AND RICHARD R. STRATHMANN, Evolution of fast development of planktonic embryos to early swimming, 58
Stem cell, 104
STEWART, NICOLA J., see Gabriel A. Delgado, 112
Stock enhancement, 112
STRATHMANN, RICHARD R., see Jennifer M. Staver, 58
Stress proteins, 331
Strombus gigas, 112
Structure, formation, mechanical properties, and disposal of the embryo attachment system of an estuarine crab, *Sesarma haematocheir*, 289
Subtractive hybridization, 217
SUGGS, DIANNE N., RUTH H. CARMICHAEL, SARA P. GRADY, AND IVAN VALIELA, Effects of individual size on pairing in horseshoe crabs, 225
Supramedullary neuron, 188
SWEEDLER, JONATHAN V., see Jennifer Marshall, 27
Swim, 58
Swimming, 144, 152
Swimming behavior of the nudibranch *Melibe leonina*, 144
Symbiodinium spp., 315
Symbiosis, sea anemone, 315

T

TEICHBERG, MIRTA, see Melissa Millman, 263
Temporal
  features, 195
  patterns, 195
TERAJIMA, M., see M. Saigusa, 289
TERWILLIGER, NORA, see Louis Burnett, 42
TESTA, JEREMY M., MATTHEW A. CHARETTE, EDWARD R. SHOLKOVITZ, MATT C. ALLEN, ADAM RAGO, AND CRAIG W. HERBOLD, Dissolved iron cycling in the subterranean estuary of a coastal bay: Waquoit Bay, Massachusetts, 255
TESTENIERE, OLIVIER, see Sefi Raz, 269
Tests of hypotheses on the adaptive value of an extended male phase in the hermaphroditic shrimp *Lysmata wurdemanni* (Caridea: Hippolytidae), 347
Thalassoma bifasciatum, 245
THOMPSON, JOSEPH T., AND WILLIAM M. KIER, Ontogeny of squid mantle function: changes in the mechanics of escape-jet locomotion in the oval squid, *Sepioteuthis lessoniana* Lesson, 1830, 14
THOMPSON, REID F., see Torsten Wöllert, 206, 208
THOMPSON, STUART, see Winsor H. Watson III, 152
A three-year retrospective study of abdominal tumors in zebrafish maintained in an aquatic laboratory animal facility, 265
Tidal flushing, 258

Tidal flushing of ammonium from intertidal salt marsh sediments: the relative importance of adsorbed ammonium, 258
TOMASKY, GABRIELLE, see Stacy Barron, 260; Carolyn F. Weber, 261
Toxin, 27
Tracking behavior of Busyconinae whelks, 235
Transplantation, 278
Tricaine, 188
Tumor, 265
Turbulent mixing, 275
TWICHELL, SARAH, SALLIE SHELDON, LINDA DEEGAN, AND ROBERT GARRITT, Nutrient and freshwater inputs from sewage effluent discharge alter benthic algal and infaunal communities in a tidal salt marsh creek, 256
TWIG, GILAD, ROBERT PAUL MALCHOW, KATHERINE HAMMAR, PETER J. S. SMITH, HANNA LEVY, AND IDO PERLMAN, A novel turtle retinal preparation for simultaneously measuring light-induced electrical activity and changes in metabolite levels, 198

U

UHLINGER, KEVIN R., see Jennifer L. Hsieh, 266
Ultrastructure, 289
Undifferentiated cells in the snail myocardium are capable of DNA synthesis and myodifferentiation, 104
UV sunscreen, 315

V

VALIELA, IVAN, see Dianne N. Suggs, 225; Emily F. Gaines, 228; Melissa Millman, 263
Velum, 80
Venom duct, 27
Vesicle transport, 206, 208, 210
Vesicular plug, 219
Vestibular, 236
VICKERY, MICHAEL C.L., see Minako Vickery, 121
VICKERY, MINAKO, MICHAEL C.L. VICKERY, AND JAMES B. MCCLINTOCK, Morphogenesis and organogenesis in the regenerating planktotrophic larvae of asteroids and echinoids, 121
Vision, 224, 227
Visual behavior of juvenile *Limulus* in their natural habitat and in captivity, 224
Visual perception, 232
Volume regulation, 194

W

WAINWRIGHT, NORMAN, see Peter B. Armstrong, 203
WATSON, W. H. III, see K. A. Lawrence, 144
WATSON, WINSOR H. III, JAMES M. NEWCOMB, AND STUART THOMPSON, Neural correlates of swimming behavior in *Melibe leonina*, 152
WEBER, CAROLYN, see Stacy Barron, 260
WEBER, CAROLYN F., STACY BARRON, ROXANNE MARINO, ROBERT W. HOWARTH, GABRIELLE TOMASKY, AND ERIC A. DAVIDSON, Nutrient limitation of phytoplankton growth in Vineyard Sound and Oyster Pond, Falmouth, Massachusetts, 261
WEIDNER, EARL, AND ANN FINDLEY, Peroxisomal catalase in extrusion apparatus posterior vacuole of microsporidian spores, 212
WEINER, STEVE, see Sefi Raz, 3381
WILLIAMS, BRADLEY, see Kristin Hunter-Thomson, 247
WILLIAMS, BRADLEY S., JEFFREY E. HUGHES, AND KRISTIN HUNTER-THOMSON, Influence of epiphytic algal coverage on fish predation rates in simulated eelgrass habitats, 248
WÖLLERT, TORSTEN, ANA S. DEPINA, REID F. THOMPSON, AND GEORGE M. LANGFORD, Ca^{2+} effects on myosin-II-mediated contraction of pseudo-contractile rings and transport of vesicles in extracts of clam oocytes, 206
WÖLLERT, TORSTEN, ANA S. DEPINA, REID F. THOMPSON, AND GEORGE M. LANGFORD, GTPase Rho is involved in myosin-II-mediated contraction of pseudo-contractile rings and transport of vesicles in extracts of clam oocytes, 208

X

Xenopus oocyte, 192

Y

YAMAMOTO, M., see M. Saigusa, 289
YOUNG, CRAIG M., see Kevin J. Eckelbarger, 134

Z

ZAKEVICIUS, JANE, see Harris Ripps, 192
Zebrafish, 200, 240, 265
  retina, 200
Zinc, 200
Zinc chelation enhances the zebrafish retinal ERG b-wave, 200
Zoochlorellae, 315
Zooxanthellae, 315
ZOTTOLI, S. J., see D. E. W. Arnolds, 188